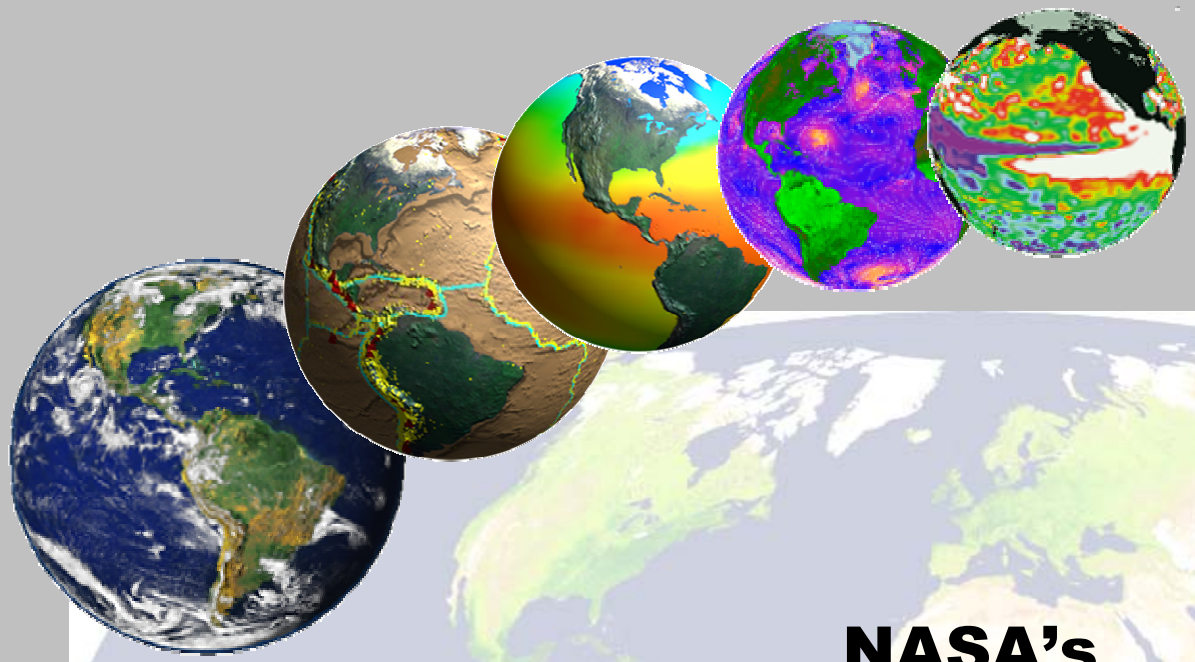


NASA's
Earth Science Enterprise
--
International Context, Progress, Challenges

IGARSS 2003
21 July 2003

An Earth Science Vision

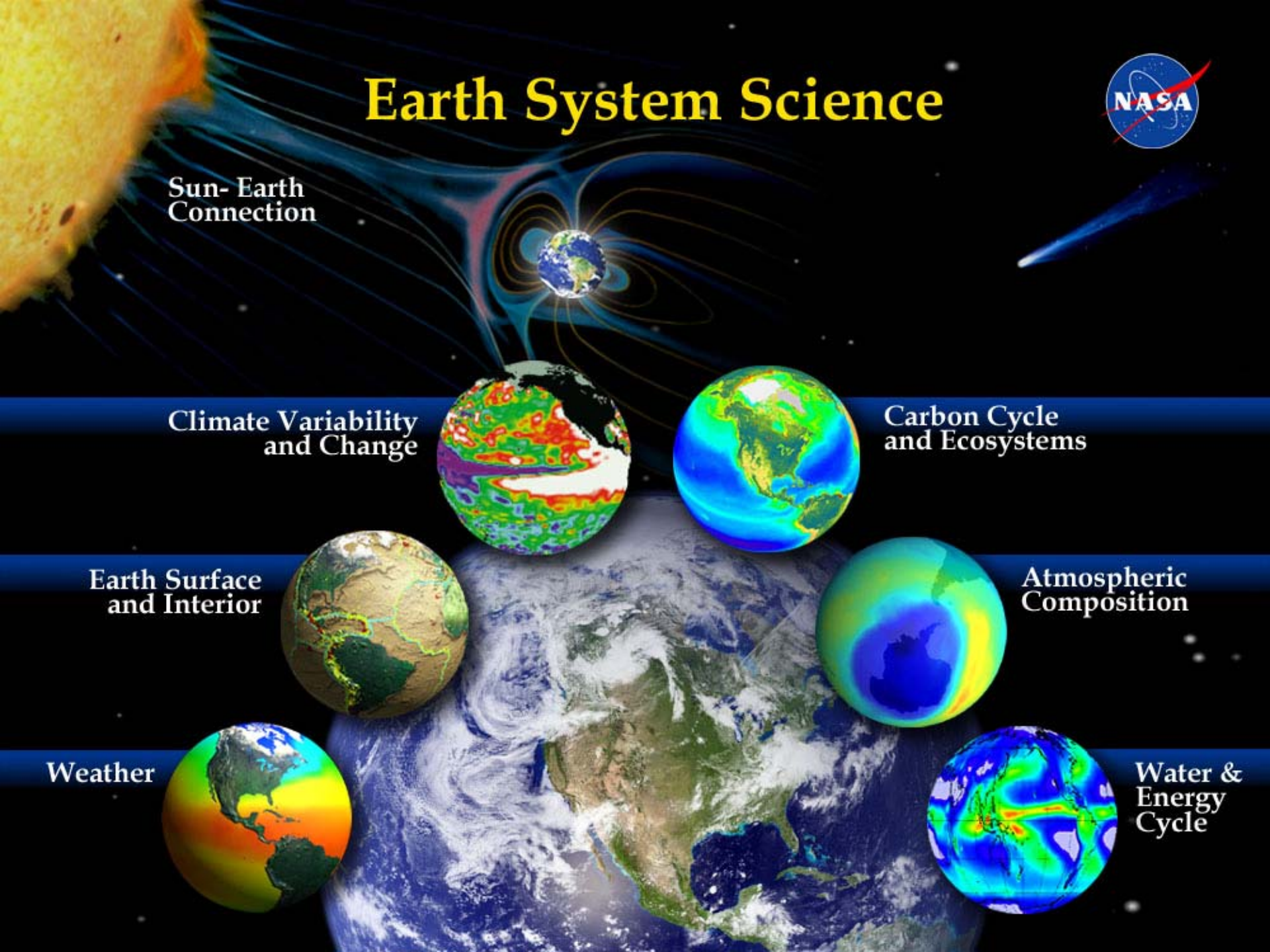
Global Understanding of the Complexities of Our Planet

Monday (MO09) July 21, 2003 - Afternoon Session 1

Chair: Gran Paules Co-Chair: Paul Curran

- **Earth System Model: *The potential for predicting future variability and change in the Earth environment using integrated Earth System Modeling*--Mark Schoeberl**
- **Ocean & Atmosphere: *Predicting monthly to seasonal climate variability and the oceanic and atmospheric causes and effects*--Peter Hildebrand**
- **Biosphere: A decadal vision: *Predicting biosphere-climate interactions and the availability of fresh water under the influence of climate change including the effects induced by humans*-- Rick Miller**
- **Solid Earth: *Predicting solid Earth interactions with climate and the effects on habitability of Earth*--Ron Blom**
- **Climate Change—*Bringing awareness to an international scale: potential implications of our coming understanding of the causes and effects of climate variability and change*--Michael J. Prather**

Earth System Science



NASA's Earth Observing System
& Related Satellites

Earth Observing System

Candidate Future Missions
In Formulation /Preformulation


Terra

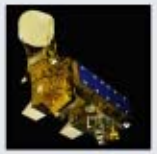

Landsat

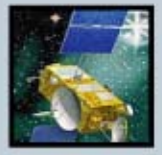

ICESat


Calipso


EO-3: GIFTS


NOAA/GOES


Aqua


Jason


SeaWiFS


Cloudsat


EO-1: ALI
& Hyperion

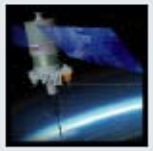

NOAA/POES

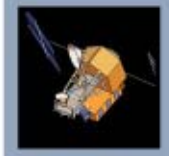

SeaWinds
(QuikSCAT, ADEOS II)


GRACE


Aura


SORCE, ACRIM


SAGE III


TRMM

The Earth Observing System -- systematic measurement of interactions among land, oceans, atmosphere, ice & life

Exploratory missions to probe key Earth system processes globally for the first time

Operational precursor/ Technology demos

Operational weather services missions for NOAA

Next Generation Missions

Next Generation Missions

Candidate Future Missions
In Formulation /Preformulation

NPOESS Preparatory Project

Ocean Vector Winds Mission

Synthetic Aperture Radar

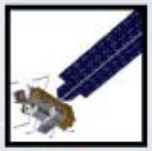
Orbiting Carbon Observatory

Advanced Gravity

Ocean Carbon

Landsat Data Continuity Mission

Global Precipitation Measurement

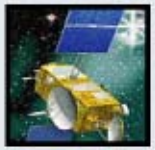


Chemistry/Climate Mission

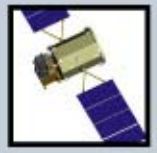
Aquarius

Cold Climate Processes

Vegetation Recovery



Ocean Surface Topography Mission



Aerosol Polarimeter Sensor

Cryosphere Monitoring Mission

Hydros

Next generation systematic measurement missions to extend/enhance the record of science-quality global change data

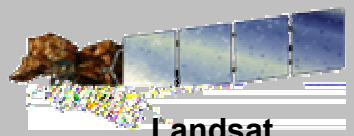
Research missions to probe key Earth system processes globally for the first time

Future research Measurements

ESE Current Missions in Orbit

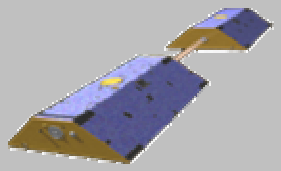
The Earth Observing System -- systematic measurement of interactions among land, oceans, atmosphere, ice & life

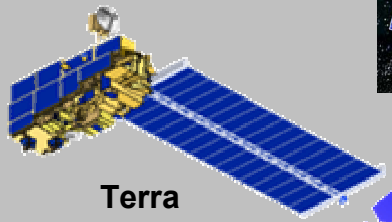
Exploratory missions to probe key Earth system processes globally for the first time

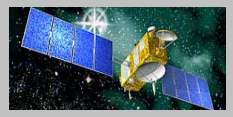

Landsat

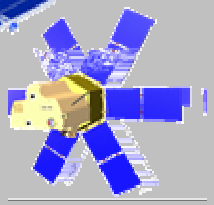

Aqua


TRMM

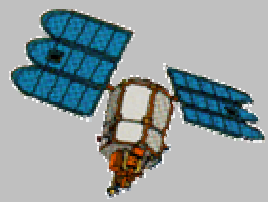

GRACE


Terra


Jason


SORCE


TOPEX/ Poseidon




ICESat


SeaWiFS

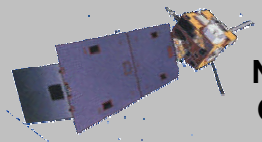

EO-1: ALI & Hyperion

Operational precursor / Technology demos

QuikScat

ERBS


ACRIMSAT


NOAA/ GOES


NOAA/ POES

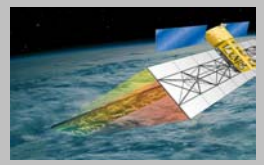
Operational weather services missions with NOAA

ESE Missions in Formulation & Implementation

Next generation systematic measurement missions to extend / enhance the record of science-quality global change data.

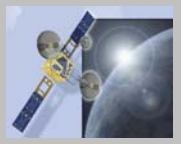
Future research measurements: Soil moisture, Advanced gravity, Ocean carbon, Cold climate processes, Vegetation recovery

Synthetic Aperture Radar

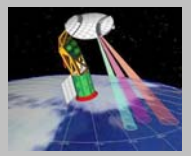


Aerosol Mission

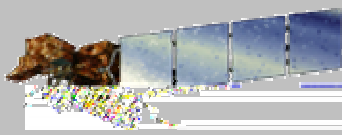
Global Precipitation Measurement



EO-3: GIFTS

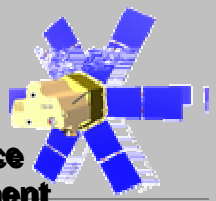


Aquarius

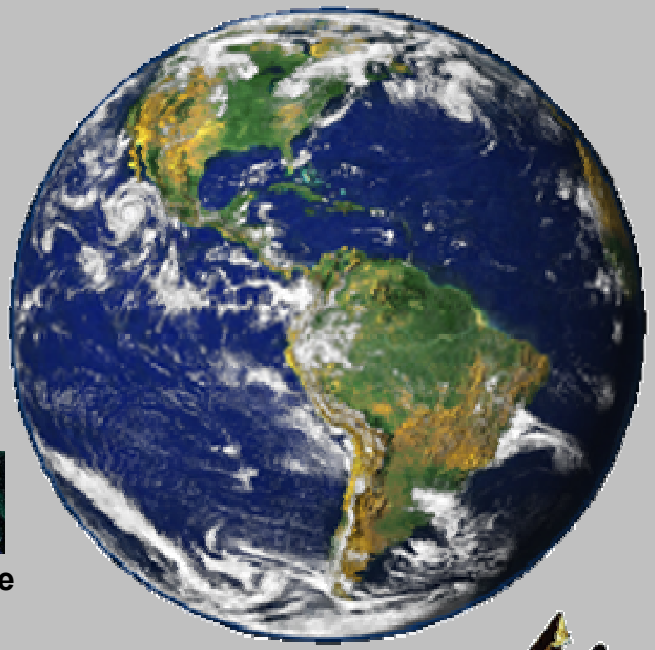


Landsat Data Continuity Mission

Chemistry / Climate Mission



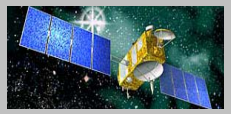
Solar Irradiance Measurement



Orbiting Carbon Observatory

Calipso

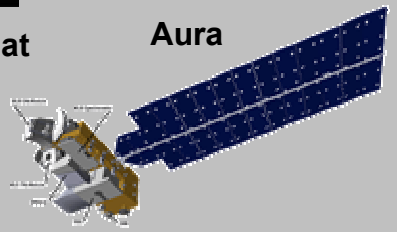
Total Column Ozone



Ocean Surface Topography Mission

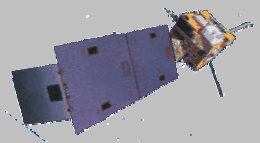
Cloudsat

Aura



Research missions to probe key Earth system processes globally for the first time

NPOESS Preparatory Project

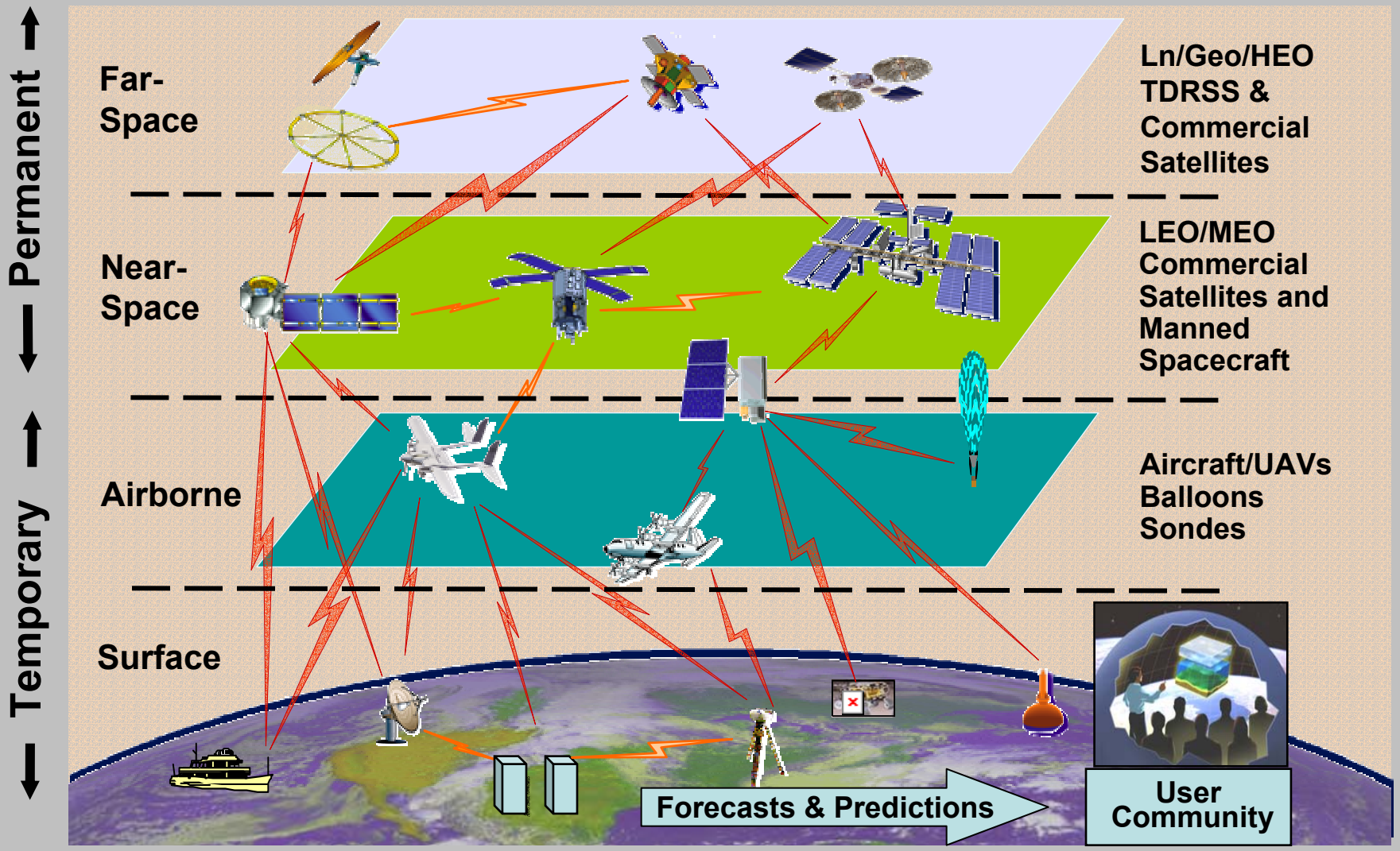


NOAA/GOES-R

NOAA / NPOESS

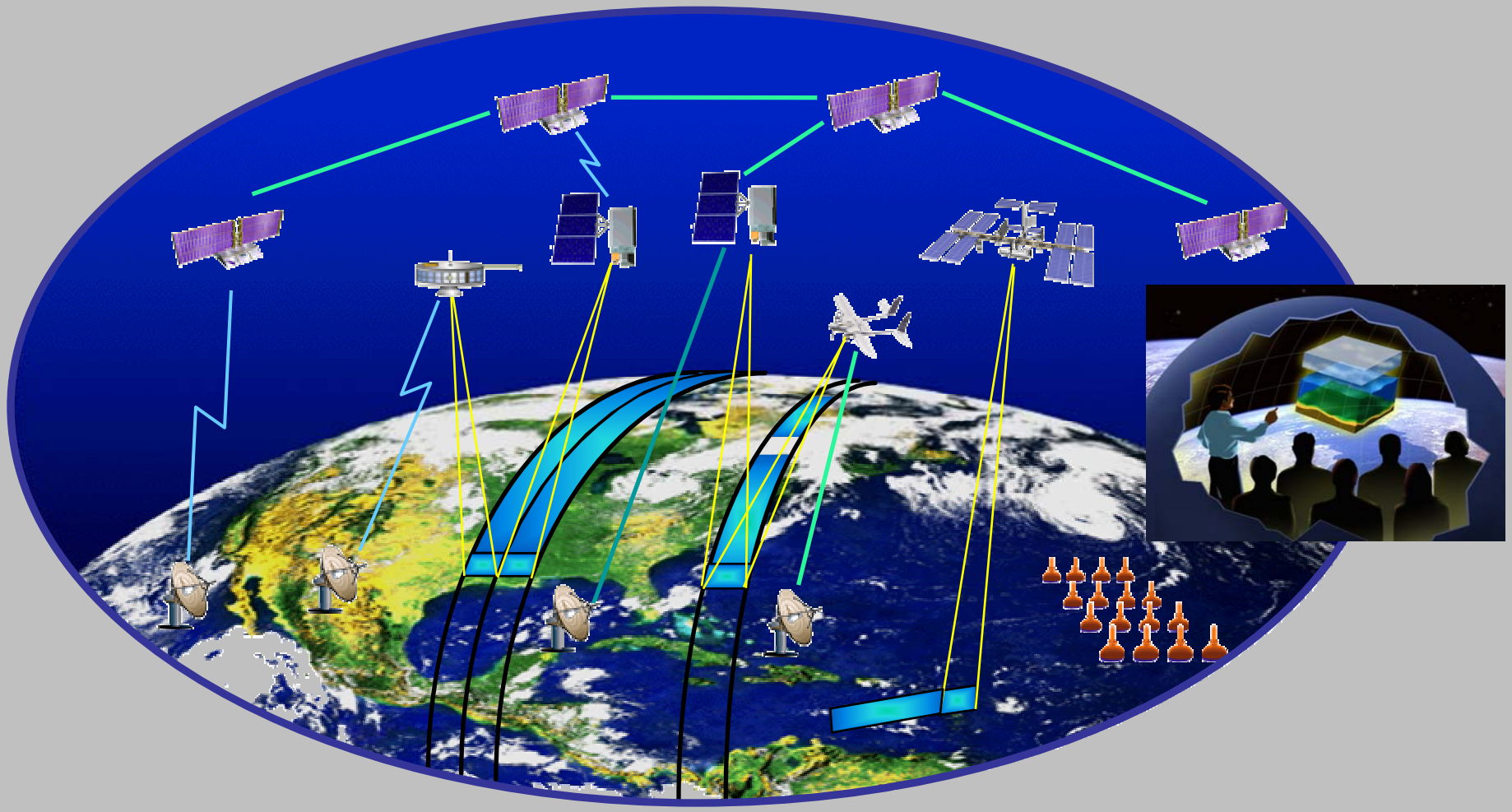
Operational weather services missions with NOAA/DOD

Improving Prediction Through Systems Integration



Integrated Observing System of the Future

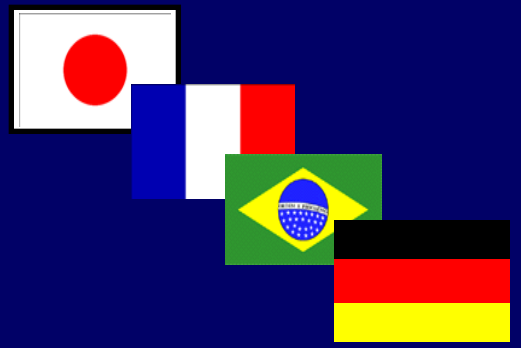
- Information Synthesis: Distributed, Reconfigurable, Autonomous



- Access to Knowledge: On-orbit Processing, Immersive Environments

Partnerships Are Essential

- International
  - Over 290 agreements with approximately 60 different countries
  - International research programs with multilateral organizations such as FAO, UNEP, WMO, WHO and CCAD
- Interagency
  - Joint weather satellite programs with NOAA & DoD
  - Landsat with DOI/USGS
  - Research and applications with USDA, DOT, NSF, FEMA, USFS
  - US Global Change Research Program
- Regional, State & Local
  - Associations of states, counties and cities
  - Consortia of local governments and universities
- Commercial
  - Traditional industrial partnerships
  - Purchases of commercial data
  - Targeted advanced technology collaborations



Earth Observation Summit

- Hosted by U. S. Government in Washington, D.C. on July 31, 2003
- Senior international government and non-government leaders in climate science, technology, and environment
- To obtain international support for a system of integrate space-borne, airborne, and *in situ* observations, to help understand and address global, environmental and economic concerns

(www.earthobservationssummit.gov)